

# Notice of Allowability

Application No.

10/501,848

Examiner

James Martinell

Applicant(s)

DOUGHERTY ET AL.

Art Unit

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308:

1. ☒ This communication is responsive to the communication filed 10/31/07.
2. ☒ The allowed claim(s) is/are 36-68.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All   b) ☐ Some\*   c) ☐ None   of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date 11/14/07.
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

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The examiner's amendment below contains the same subject matter as claims 1-33. The amendment filed October 26, 2006 was in improper form in that it added claims 13-35 and did not contain accurate claim identifiers. The amendment filed October 26, 2006 should not have been entered, but was entered and claims 1-33 were examined on the merits. The error is regretted. In order to clarify the record, claims 1-33 are cancelled and new claims 36-68 which are the same as claims 1-33 are added.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Maurer on November 14, 2007.

Cancel claims 1-33.

Add claims 36-68.

- Claim 36 (new). A method of generating a simulated microarray image, the method comprising:
  - receiving a plurality of simulation parameters; and
  - generating the simulated microarray image based at least on the simulation parameters.

Claim 37 (new). A computer-readable medium comprising computer-executable instructions for performing the method of claim 36.

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Claim 38 (new). A method comprising:

generating a simulated microarray image based on simulation parameters, wherein the simulated microarray image is associated with known values; and

analyzing the simulated microarray image via a microarray imaging procedure, the analyzing comprising calculating observed values.

Claim 39 (new). A computer-readable medium having computer-executable instructions for performing the method of claim 38.

Claim 40 (new). The method of claim 38 further comprising:

comparing the known values with the observed values to benchmark the microarray imaging procedure.

Claim 41 (new). The method of claim 38 wherein the values comprise spot intensity values.

Claim 42 (new). The method of claim 41 further comprising:

generating a rating based on results of the comparing, wherein the rating indicates effectiveness of the microarray imaging procedure.

Claim 43 (new). The method of claim 38 wherein the generating comprises simulating a fluorescent background level for the simulated microarray image.

Claim 44 (new). The method of claim 38 wherein the generating comprises simulating spots for the simulated microarray image.

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Claim 45 (new). The method of claim 38 wherein the generating comprises simulating post-processing phenomena for the simulated microarray image.

Claim 46 (new). A method for simulating a microarray, comprising:

- defining a plurality of parameters;
- generating a simulated microarray according to the parameters using an imaging procedure;
- comparing the simulated microarray to a known value; and
- evaluating the imaging procedure in response to the comparison.

Claim 47 (new). A computer-readable medium having computer-executable instructions for performing the method of claim 46.

Claim 48 (new). A computer-implemented method of generating a simulated microarray image, the method comprising:

- receiving a plurality of simulation parameters; and
- generating the simulated microarray image based at least on the simulation parameters.

Claim 49 (new). A computer-readable medium comprising computer-executable instructions for performing a computer-implemented method of generating a simulated microarray image, the method comprising:

- receiving a plurality of simulation parameters; and
- generating the simulated microarray image based at least on the simulation parameters.

Claim 50 (new). The computer-implemented method of claim 48 wherein the simulated microarray image is associated with known values, the method further comprising:

- analyzing the simulated microarray image via a microarray imaging procedure, the analyzing comprising calculating observed values; and

- comparing the known values with the observed values to benchmark the microarray imaging procedure.

Claim 51 (new). The computer-implemented method of claim 50 wherein:

- the known values comprise signal intensities;

- the observed values comprise signal intensities; and

- the comparing compares the signal intensities of the known values with the signal intensities of the observed values.

Claim 52 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates random perturbations in array preparation, printing, and scanning.

Claim 53 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates background noise.

Claim 54 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates radius variation of cDNA deposition spots.

Claim 55 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates spot drift of cDNA deposition spots.

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Claim 56 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates center core variation of cDNA deposition spots.

Claim 57 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates chord removal of cDNA deposition spots.

Claim 58 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates edge noise of cDNA deposition spots.

Claim 59 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates edge enhancement of cDNA deposition spots.

Claim 60 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates signal intensity.

Claim 61 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates channel conditioning.

Claim 62 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates spike noise.

Claim 63 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates scratch noise.

Claim 64 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates snake noise.

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Claim 65 (new). The computer-implemented method of claim 48 wherein the simulated microarray image simulates smoothing.

Claim 66 (new). The computer-implemented method of claim 48 wherein the generating comprises randomization at a spot level of the simulated microarray image.

Claim 67 (new). The computer-implemented method of claim 48 wherein the generating comprises randomization at a block level of the simulated microarray image.

Claim 68 (new). The computer-implemented method of claim 48 wherein the generating comprises randomization at an array level of the simulated microarray image. --

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Martinell whose telephone number is (571) 272-0719.

The examiner works a flexible schedule and can be reached by phone and voice mail.

Alternatively, a request for a return telephone call may be e-mailed to [james.martinell@uspto.gov](mailto:james.martinell@uspto.gov). Since e-mail communications may not be secure, it is suggested that information in such requests be limited to name, phone number, and the best time to return the call.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla, can be reached on (571) 272-0735.

**OFFICIAL FAX NUMBER**


The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any Official Communication to the USPTO should be faxed to this number.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

  
**James Martinell, Ph.D.**  
**Primary Examiner**  
**Art Unit 1634**

11/14/07



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Dougherty et al.

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Application No.: 10/501,848

Filed: July 16, 2004

For: SIMULATING MICROARRAYS USING A  
PARAMETERIZED MODEL

Examiner: James Martinell

DECLARATION OF MICHAEL L. BITTNER UNDER 35 C.F.R. § 1.132

With respect to the above-identified patent application, I, Michael L. Bittner, declare as follows:

1. All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true; and further these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. I have examined the article "A Random Signal Model for cDNA Microarrays" ("the Article"), which was published on or after January 19, 2001, in vol. 4266 of *Proceedings of SPIE*.

3. I am listed as an author on the Article.

4. I worked with named inventor Yidong Chen during development of the technologies described in the Article.

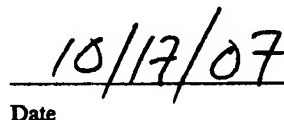
5. I have expertise and experience in the field of microarray images. I was consulted by named inventor Yidong Chen regarding whether simulated microarray images generated by the technologies described in the Article had realistic qualities mimicking those found in real microarray images.

6. I have reviewed the claims currently pending for the above patent application.

7. While I did serve the role of consultant for the technologies, I did not contribute to the conception of any of the claimed subject matter.

8. J. M. Trent ("Mr. Trent") is listed as an author on the Article. Mr. Trent was the scientific director of the National Human Genome Research Institute's Division of Intramural Research and served in a leadership role of the Division, but he did not contribute to the conception of the any of the claimed subject matter. Because of his position as an organizational head of the Division, Mr. Trent was given authorship credit on the Article.

  
Michael L. Bittner

  
Date